

REMARKS/ARGUMENTS

Claims 30-54 are pending in this application. By this Amendment, Applicant cancels Claims 55-58.

Applicant's Claims 55-58 have been canceled because these claims are directed to a non-elected invention. Applicant respectfully reserves the right to file a Divisional Application to pursue prosecution of non-elected Claims 55-58.

Applicant appreciates the Examiner's indication that Claims 40-45 and 49 would be allowable if rewritten in independent form including all of the features of the base claim and any intervening claims.

Claims 30-39, 46-48, and 50-54 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Ogawa (WO 98/52279). Applicant respectfully traverses the rejection of Claims 30-39, 46-48, and 50-54.

Claim 30 recites:

A boundary acoustic wave device comprising:
a first medium layer;
a second medium layer stacked on the first medium layer;
an electrode disposed in an interface between the first medium layer and the second medium layer, wherein boundary acoustic waves propagate along the interface between the first and second medium layers; and
a sound absorbing layer disposed on at least one of external surfaces of at least one of the first and second medium layers opposite to the interface so as to attenuate spurious responses.
(emphasis added)

With the unique combination and arrangement of features recited in Applicant's Claim 30, including the feature of "a sound absorbing layer disposed on at least one of external surfaces of at least one of the first and second medium layers opposite to the interface so as to attenuate spurious responses," Applicant has been able to provide a boundary acoustic wave device that prevents a plurality of spurious responses in the region higher than the resonant frequency or the pass band and exhibits superior frequency characteristics (see, for example, paragraph [0014] of the Substitute

Specification).

The Examiner alleged that Ogawa teaches a boundary acoustic wave device including a first medium layer 28, a second medium layer 29, 30 stacked on the first medium layer 28, an electrode 14 disposed in an interface between the first and second medium layers, and a sound absorbing layer 27. The Examiner acknowledged that the sound absorbing layer 27 is not disposed on the external surface of the second medium layer 29 or 30. However, the Examiner further alleged, "it would have been obvious at the time the invention was made to stack a sound absorbing layer on one of the external surfaces of the medium layers to attenuate spurious responses, as it is well known in the art." Applicant respectfully disagrees.

Contrary to the Examiner's allegations, the layer 27 of Ogawa clearly cannot be fairly construed as a sound absorbing layer as recited in Applicant's Claim 30.

When acoustic waves propagate through a multilayer composite substrate including a layer having a low acoustic velocity and a layer having a high acoustic velocity, the acoustic waves propagate with their energy concentrated on the layer having a low acoustic velocity. The inventor of the present invention discovered that although boundary acoustic waves attenuate on the external surface of a second medium, spurious responses do not attenuate on the external surface of the second medium, and that a sound absorbing layer must be disposed on the external surface of the second medium in order to attenuate spurious responses. Since the acoustic wave velocity of the sound absorbing layer has a lower acoustic wave velocity than that of the second medium layer, the spurious responses are transferred from the second medium to the sound absorbing layer, which provides outstanding attenuation of the spurious responses. In order for the sound absorbing layer of the present invention to attenuate spurious responses, the sound absorbing layer must be formed of a material having an acoustic wave velocity that is lower than an acoustic wave velocity of the second medium layer so as to concentrate the spurious responses on the sound absorbing layer instead of on the second medium. See, for example, paragraphs [0110] to [0118],

[0129], and [0136] of the Substitute Specification.

As interpreted by the Examiner, Ogawa teaches a first medium layer 28, a medium layer 29, 30, and a layer 27, which the Examiner alleged corresponds to the sound absorbing layer recited in Applicant's Claim 30. However, layer 29 of Ogawa is disclosed as being a polycrystal silicon dioxide (SiO_2) layer, layer 30 of Ogawa is disclosed as being a polycrystal silicon (Si) layer, and layer 27 is disclosed as being a polycrystal silicon nitride (SiN) layer. The transverse acoustic wave velocities are 3757 m/s for the SiO_2 layer, 5341 m/s for the Si layer, and 5973 m/s for the SiN layer; and the longitudinal acoustic wave velocities are 5960 m/s for the SiO_2 layer, 8945 m/s for the Si layer, and 10,642 m/s for the SiN layer.

Since layer 27 of Ogawa, which the Examiner alleged corresponds to the sound absorbing layer recited in Applicant's Claim 30, is made of SiN which has an acoustic wave velocity that is higher than either of the layers 29 and 30 of Ogawa, which the Examiner alleged corresponds to the second medium layer recited in Applicant's Claim 30, the layer 27 of Ogawa is completely incapable of attenuating spurious responses. In fact, since the acoustic wave velocities of each of layers 29 and 30 of Ogawa are less than the acoustic wave velocity of the layer 27, the spurious responses in Ogawa would be concentrated in the layers 29 and 30, and in no way attenuated by the layer 27.

In fact, Ogawa fails to disclose anything at all about spurious responses, and certainly fails to teach or suggest anything at all about attenuating spurious responses. Thus, the layer 27 of Ogawa clearly cannot be fairly construed as the feature of "a sound absorbing layer disposed on at least one of external surfaces of at least one of the first and second medium layers opposite to the interface so as to attenuate spurious responses" as recited in Applicant's Claim 30. Furthermore, contrary to the Examiner's allegations, it would not have been obvious to one of ordinary skill in the art "to stack a sound absorbing layer on one of the external surfaces of the medium layers to attenuate spurious responses" as alleged by the Examiner since (1) Ogawa fails to mention anything at all about spurious responses or the necessity to attenuate the spurious

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responses; and (2) even if the layer 27 Ogawa were disposed on the external surface of the medium layers 29 and 30 of Ogawa, spurious responses would not be attenuated.

Accordingly, Applicant respectfully requests reconsideration and withdrawal of the rejection of Claim 30 under 35 U.S.C. § 103(a) as being unpatentable over Ogawa.

In view of the foregoing amendments and remarks, Applicant respectfully submits that Claim 30 is allowable. Claims 31-54 depend upon Claim 30, and are therefore allowable for at least the reasons that Claim 30 is allowable.

In view of the foregoing amendments and remarks, Applicant respectfully submits that this application is in condition for allowance. Favorable consideration and prompt allowance are solicited.

The Commissioner is authorized to charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account No. 50-1353.

Respectfully submitted,

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